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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PF030152	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/EP2004/010083	International filing date *(day/month/year)* 09.09.2004	Priority date *(day/month/year)* 01.10.2003
International Patent Classification (IPC) or national classification and IPC G09G3/28		
Applicant THOMSON PLASMA et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *sent to the applicant and to the International Bureau)* a total of 3 sheets, as follows:
      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
16.11.2005	08.03.2006
Name and mailing address of the International preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Vázquez del Real, D Telephone No. +31 70 340-4863

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/010083

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages	
1-10	as originally filed
Claims, Numbers	
1-11	filed with telefax on 16.11.2005
Drawings, Sheets	
1/13-13/13	as originally filed

   ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☒ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☒ the claims, Nos. 12-16
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	2-10
	No:	Claims	1,11
Inventive step (IS)	Yes:	Claims	2-10
	No:	Claims	1,11
Industrial applicability (IA)	Yes:	Claims	1-11
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V.

1 Reference is made to the following documents:

D1 : EP 1 030 286 A (FUJITSU LTD) 23 August 2000 (2000-08-23)
D2 : EP 1 172 788 (FUJITSU LTD) 16 January 2002 (2002-01-16)

2 INDEPENDENT CLAIM 1

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.
The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses (the references in parentheses applying to this document):

Device for driving a plasma display panel having a plurality of cells arranged in rows and columns, said device comprising row address means for selectively addressing the display cell rows and creating, where required, in cooperation with means for selectively applying data voltages to the display columns, an electrical discharge inside the cell disposed at the intersection of the row and column selected during an address phase, and sustain means for sustaining the electrical discharges inside said cell during a sustain phase immediately following the address phase (paragraph [0003]-[0004]) , characterized in that said sustain means are capable of allowing a bi-directional current to flow within the cells of the display during said sustain phase (paragraph [0025]-[0027] and fig. 4).

2.2 The subject-matter of claim 1 therefore differs from this known from D1 in that:

The addressing of rows is performed in a block basis and the voltage applied to the cells of the block of rows not being addressed (Vbw2) is higher than the voltage applied to the cells of the block of rows being addressed (Vbw1)

2.3 The problem to be solved by the present invention may therefore be regarded as:

Addressing misdischarges due to the influence of ambient temperature and accumulated heat.

2.4 The solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

D2 discloses a block addressing method wherein the voltage applied to the cells of the block of rows not being addressed, Vya3, is higher than the voltage applied to the cells of the block of rows being addressed, Vya2 (see D2, paragraphs [0059]-[0060] and fig. 3) in order to provide a stable display not affected by variations of the temperature and the power source voltage (paragraph [0002]).

2.5 Therefore, the skilled person trying to counteract the temperature dependance of the address discharges would find the document D2 and would combine the teachings of D2 with document D1 in order to solve the problem posed, as it is mentioned in the description (see pag. 8, lines 31-3)

3 DEPENDENT CLAIMS 2-16

3.1 Claim 11 describing a plasma display panel comprising a driver device according to claim 1 has been already implemented in D1 (see D1, fig 9)

3.2 The combination of the features of dependent claims 2-10 are neither known from, nor rendered obvious by, the available prior art. The reasons are as follows:

Scan-sustain electrode electrode driving circuits for PDPs use diodes (see drawings fig. 3 D1, D2 & D3) to prevent conduction to some of the power supplies during the priming or erasing period.
Additionally, the existence of these diodes prevent a capacitive current to flow between non-coplanar electrodes (address electrodes and scan-sustain electrodes) and through the cell that is selected for addressing or sustaining to finish freely in the corresponding power supply. As a result, overvoltages are created within the cell

concerned. Removing those diodes avoids the formation of such overvoltages.

CLAIMS

1. Device for driving a plasma display panel having a plurality of cells arranged in rows and columns, the rows of cells being distributed in a plurality of block of lines (B1,B2), said device comprising row address means for selectively addressing the display cell rows within the blocks and creating, where required, in cooperation with means for selectively applying data voltages to the display columns, an electrical discharge inside the cell disposed at the intersection of the row and column selected during an address phase, and sustain means for sustaining the electrical discharges inside said cell during a sustain phase immediately following the address phase,

characterized in that said row address means comprise row address means for addressing successively the blocks of rows by applying a first voltage (Vbw1) to the cells of the selected block and a second voltage (Vbw2) to the cells of the other blocks, said second voltage being greater than the first voltage (Vbw1) and in that said row address means and/or sustain means are capable of allowing a bi-directional current to flow within the cells of the display during said address and/or sustain phases.

2. Device according to Claim 1, characterized in that the row address means for each block of rows (B1, B2) comprises:

- at least one row driver circuit (11) for each of the blocks of rows connected between the first and second connection lines (L1, L2; L1', L2') and designed to apply, during an address phase specific to said block of rows, the potential of one of said first and second connection lines to a first electrode (Yas) of the cells of a plurality of rows of the block,
- a first switch (I2; I2') for selectively applying an address voltage (Vw) to the second connection line (L2; L2') during the address phase,
- a first diode (D1; D1') connected in series with a second switch (I1; I1') for applying said first voltage (Vbw1) to the first connection line (L1; L1') during the address phase, said diode being oriented so as to allow a current to flow in the direction of the first connection line (L1, L1'),
- a capacitor (C1; C1') for connecting the cathode of the first diode (D1; D1') to the second connection line (L2; L2'),

- a switching means (I10; I10') for isolating said first connection line (L1; L1') from the sustain means of said driver device during the row address phase of the relevant block, and

- a third switch (I8) for applying said second voltage (Vbw2) to said first connection line (L1; L1') during the address phases specific to the other blocks.

3. Device according to Claim 2, characterized in that said third switch (I8) is common to the address means of the blocks of rows.

4. Device according to Claim 3, characterized in that the switching means is a switch (I10; I10') connected between the sustain means of the device and said first connection line (L1; L1'), which switch is open during the row address phase of the relevant block.

5. Device according to one of Claims 2 to 4, characterized in that said second voltage (Vbw2) is equal to said high sustain voltage (Vs).

6. Device according to any one of Claims 2 to 5, characterized in that the sustain means comprise:

- third and fourth switches (I3, I4) for selectively applying a high sustain voltage (Vs) and a low sustain voltage to said first connection line (L1; L1') of the blocks when the switching means of said blocks is in the on state,

- fifth and sixth switches (I5, I6) for selectively applying said high sustain voltage (Vs) and said low sustain voltage to a second electrode (Y) of the cells of the plurality of rows selected by said row driver circuit (11), said third and sixth switches (I3, I6) on the one hand, and said fourth and fifth transistors (I4, I5) on the other, being controlled in an identical manner.

7. Device according to Claim 6, characterized in that the sustain means additionally comprise:

- a second diode (D3) connected in series with said third switch (I3) and oriented so as to allow a current to flow into the first connection line (L1; L1') of the blocks when the switching means of said blocks is in the on state, and

- third and fourth diodes (D7, D8) connected in parallel with the third and fourth switches (I3, I4), respectively, and
- fifth and sixth diodes (D5, D6) connected in parallel with the fifth and sixth switches (I5, I6), respectively.

8. Device according to one of Claims 3 to 7, characterized in that said third switch (I8) is connected in parallel with said second diode (D3).

9. Device according to one of Claims 6 to 8, characterized in that the sustain means additionally comprise a fifth switch (I7; I7') inserted between the first and second connection lines of each block, which switch is open during the row address phase of the relevant block and closed during the sustain phase.

10. Device according to Claim 9, characterized in that the switching means for isolating the first connection line (L1; L1') from the sustain means of said driver device during the row address phase of the relevant block is a diode (D10; D10') connected between the sustain means of the device and said first connection line (L1; L1'), which diode is oriented so as not to allow a current to flow in the direction of the first connection line (L1) and in that the fifth switch (I7,I7') is inserted between the sustain means of the device and said second connection line (L2,L2').

11. Plasma display panel characterized in that it comprises a driver device according to one of Claims 1 to 10.